



Voltaggio Consulting, LLC

A Limited Liability Company

1529 Chalet Drive Cherry Hill New Jersey 08003

Telephone: 856-745-1488 Facsimile: 856-673-0243

Email: tom@voltaggioconsulting.com Web: www.voltaggioconsulting.com

March 20, 2014

Policy Issues Raised by the Prospect of an FFS for the Lower Passaic

1 - The Use of an FFS for Remedy Determination for the Lower 8 Miles of the Lower Passaic River ("LPR") Is Inconsistent with the National Contingency Plan

An FFS is a tool used by EPA to expedite CERCLA cleanups when a presumptive remedy or interim action will be employed. As explained in more detail below, FFSs have been used in limited circumstances where there are few technical issues surrounding a remedial action or to implement interim remedies while a detailed environmental investigation is completed. A remedy of the scale contemplated by the LPR FFS—some combination of dredging and capping eight miles of river, at a cost estimated to range between \$400 million and \$3.5 billion or more, to be implemented over the course of many years—should be evaluated and selected through CERCLA's well-established RI/FS process, rather than characterized as an "interim remedy" subject only to an abbreviated FFS process. The scale of two of the three remedial alternatives (the only alternatives considered in the draft FFS in 2007) being considered by Region 2 goes far beyond anything ever developed through an FFS process. If implemented, either of those two proposed alternatives would constitute one of the largest, if not the largest, sediment remedy ever selected by USEPA. Region 2's proposed course reflects a misuse of the FFS process, which was conceived and intended for truly focused work, not to prematurely select a final remedy for eight miles of an urban river immediately prior to the scheduled completion of an RI/FS that has been under preparation for 20 years, a testament to the need for extensive data collection and analysis at the Site. That it is taking Region 2 seven years to finalize the FFS underscores the complexity of developing remedial alternatives for the LPR, the unsuitability of an FFS to do so, and the need for EPA to comply with the NCP.

There is no precedent for Region 2's decision to proceed with an FFS for the lower eight miles of the Passaic. In fact, an examination of the origin of the FFS and USEPA's past practice in using an FFS as part of a CERCLA cleanup demonstrate that the use of an FFS in the lower Passaic is inconsistent with USEPA's policy and practice. For a cleanup as large and complex as that being contemplated for the Passaic, a full RI/FS is necessary before a remedial action may be selected. As explained below, the FFS is a tool of USEPA's invention that is not governed by the NCP. Region 2's use of an FFS in the lower eight

miles of the Passaic appears to be an attempt to advance Region 2's preferred remedy of dredging without thorough consideration of the data being collected in the ongoing RI/FS, thereby circumventing the requirements of the NCP. Importantly, major portions of the FFS are incomplete, unpublished, unreviewed, and possibly have not even been initiated. This consideration is particularly salient given the uncertainties surrounding the question of how much to dredge and where; what risks will be associated with re-entrainment of contaminated sediment; and the apparent absence of sufficient evaluation of natural attenuation, costs, and disposal option difficulties.

The term "focused feasibility study" is not found in the NCP. The first use of the concept appears to be in USEPA's 1994 Guidance on Accelerating CERCLA Environmental Restoration at Federal Facilities. This guidance memorandum was intended to support the "accelerat[ion] and develop[ment of] streamlined approaches to the cleanup of hazardous waste" at federal facilities. The guidance memorandum encourages the development of presumptive remedies as standardized methods to approach similar or recurring contamination problems. The guidance states that "[f]ollowing site characterization, a focused Feasibility Study (FS) or Engineering Evaluation/Cost Analysis (EE/CA) may be sufficient when employing the presumptive remedy approach." Notably, the USEPA's 1994 Guidance was issued to provide specific guidance for federal facilities as a companion to the earlier OSWER Directive 9203.1-03 for privately-owned facilities (USEPA, 1992). This earlier directive mentions neither presumptive remedies nor the use of an FFS.

It does not appear that USEPA has issued any subsequent guidance on why and when it is appropriate to initiate an FFS rather than an FS. An evaluation of USEPA practice reveals that the use of the FFS process has grown over time to exceed the limited circumstances outlined in the USEPA's 1994 guidance memorandum. A review of USEPA's practice reveals three primary situations in which the FFS has been used:

1. Interim Remedial Actions: FFSs have been used to evaluate alternatives for interim remedial actions in situations where a full remedy will follow. However, when an FFS is used to implement an interim remedy, it is critical that any actions taken under the FFS be consistent with the broader RI/FS.
2. Implementation of a Presumptive Remedy: The use of the FFS outlined in the original USEPA guidance memorandum was for the implementation of a presumptive remedy. Presumptive remedies are implemented at sites where there are not significant, site-specific technical issues that require evaluation before implementation of a remedy.

3. Implementation of a Remedy at a Similarly-Situated Operable Unit (OU) within a Larger Site: When significant amounts of data have been obtained and analyzed during previous RIs, Remedial Designs (RDs), or RI/FSs performed at other OUs at a site, an FFS may be used to implement a remedy at a newly-addressed, similarly situated OU. In practice, an FFS will only be used at a later OU when a full RI/FS has already been conducted for the similar, earlier remediated OU.

Each of these applications demonstrates that the FFS can be an important tool to increase efficiency and decrease costs when further data collection and analysis are not required to develop and choose among a set of remedial alternatives. However, this is not the case in the lower eight miles of the Passaic River. At this time, the ongoing RI/FS for the LPR has yet to resolve questions regarding the distribution of contaminated sediment, pathways for redistribution of contamination, or the remedial options that will most effectively address the contaminated sediment that is present in the environment. The complexities arising from the variable distribution of contaminated sediment, scope of the study area, contaminants from ongoing sources, and the magnitude of the remedies under consideration all lead to the conclusion that the Lower Passaic River is not the type of site to which a presumptive remedy can be applied.

Furthermore, significant technical questions that will influence both the baseline risk assessment and ultimate remedy selection remain in the ongoing RI for the LPR. At the same time, Maxus, on behalf of Occidental have implemented interim remedial actions in the LPR. Given that the areas of greatest concern are already being addressed and significant technical issues remain unresolved, an FFS is not justifiable for the lower eight miles of the Passaic River. At least one of the alternatives being considered under the FFS may well not be consistent with the FS preferred remedy for the entire LPR, given that they involve bank-to-bank dredging and the FS remedy may involve targeted dredging. Additionally, the RI/FS remedy may require some form of upland or upriver actions to control ongoing sources of contamination that impact the lower eight miles of the River. An FFS performed before the RI/FS is completed for the entire LPR could obstruct the final process and is inconsistent with the NCP and USEPA guidance. In addition, the FFS deprives the PRPs the opportunity to meaningfully participate in the RI/FS process as provided in the RI/FS guidance before selection of significant and costly remedial actions.

There is substantial risk that, if Region 2 acts on the basis of the abbreviated FFS process, it will select an alternative that will fail, partially or fully, to achieve the desired risk management objectives and/or will be inconsistent with the final remedy determined from the full RI/FS. These considerations suggest that Region 2 should allow the RI/FS process to continue on its schedule and not divert resources to the FFS that would later have to be amended to conform to the RI/FS. Rather than select a final remedy in the guise of an "interim action" based on an abbreviated process, Region 2 should develop a measured approach based on the full RI/FS, which will allow Region 2 to implement a

logical, iterative action plan for the entire 17 miles of the River.

2 - Region 2 has not adequately considered the ability of dredging to meet risk-based goals or the alternative of monitored natural recovery.

Environmental dredging is a complex and expensive process that does not always meet- and may actually delay or impede- environmental risk reduction goals. Based on the information provided in the FFS Summary, it is not clear that Region 2 has adequately considered the challenges associated with implementation of environmental dredging or the benefits of monitored natural recovery (MNR) as an alternative.

MNR consists of allowing natural processes to reduce sediment contamination below risk levels. Enhanced monitored natural recovery (EMNR) broadcasts coarse-grained materials over the sediment surface to accelerate the process of natural recovery. USEPA guidance states “[d]ue to the limited number of cleanup methods available for contaminated sediment, generally, project managers should evaluate each of the three potential remedy approaches (sediment removal, capping, and MNR) at every sediment site. At large or complex sites, project managers have found that alternatives that combine a variety of approaches are frequently cost effective (USEPA 2005). It is not clear that Region 2 considered MNR as a stand-alone remedy that could avoid the challenges posed by environmental dredging.

Remedial alternatives that rely primarily on dredging to achieve risk-based goals have demonstrated limitations as a result of the effects of sediment resuspension and residuals (Bridges et al. 2010), and the timeframes for reaching acceptable risk levels at the site may span decades. These considerations must be accounted for in the development and evaluation of the alternatives. When a Feasibility Study is performed, each potential alternative must have a remedy-specific risk assessment to determine to what extent levels of risk will be reduced and/or how long it will take to reach remediation goals. Many sediment sites can reach targeted risk levels over time via MNR or enhanced MNR without the additional risks created by dredging and associated resuspension. The agency recognizes the use of MNR as an appropriate alternative for Superfund sites, especially where remediation costs are extremely high, as is the case here.

If many sediment remedies (even no further action) can result in achievement of remediation goals over time, the decision maker needs to balance the cost of different alternative remedies against the time it will take to achieve such goals. As there are no hard and fast rules governing the timing to achieve remediation goals, it becomes a judgment of the decision maker to decide how much money is too much to reduce the time it takes to meet remediation goals.

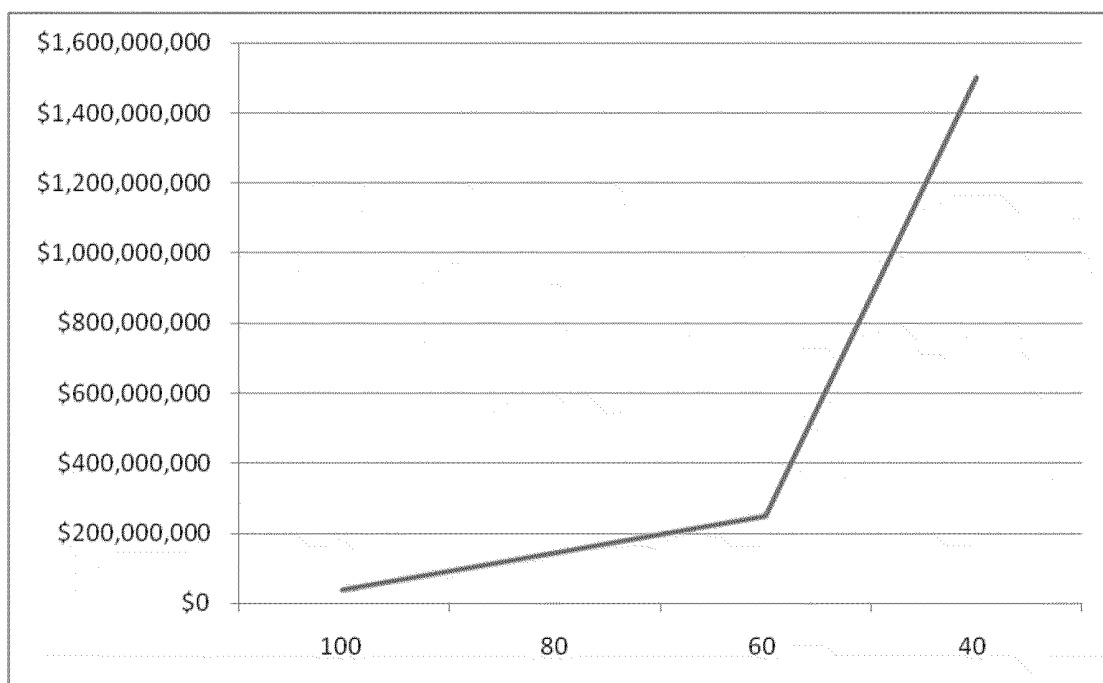
The issue to be considered is whether it is good public policy to require the expenditure of huge amounts of dollars for the deep dredging or bank-to-bank

dredging and capping remedies to achieve remediation goals if it takes “x” years, when perhaps a much less costly MNR or EMNR remedy will only take “y” years longer?

Below please find a **hypothetical** example of a type of analysis that would be useful to explore in a Feasibility Study for such a large remedy.

Since there are no hard and fast rules governing the timing to achieve remediation goals, it becomes the reasoned judgment of the Superfund remedy decision maker in deciding the cost effectiveness of spending substantially more money in the hope of reducing the time to achieve remediation goals by x years.

The following chart illustrates this concept:



The x - axis depicts years to reach remediation goals. The Y axis is remedy cost beyond MNA cost. The \$0 line is the MNA remedy. One can see that one will spend \$250M more than MNA costs to shorten achievement of compliance 40 years (100-60 years), but must spend \$1.25 Billion to shorten compliance achievement by another 20 years (60-40 years).

This type of analysis is crucial to sound decision-making for a complex, expensive and multi-year remedy.

Thomas C Voltaggio
March 20, 2014